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09/712,626	11/14/2000	Soon-Jai Khang	UOC-128D	3705

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EXAMINER

VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 12/12/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09-712,626

Applicant(s)

KHANG et al.

Examiner

VANDY

Group Art Unit

1754

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-60 is/are pending in the application.
- Of the above claim(s) 42-60 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-41 is/are rejected.
- ☒ Claim(s) 10, 18 AND 19 is/are objected to.
- ☒ Claim(s) 1-60 are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The drawing(s) filed on Nov. 14, 2000 is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 3
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-41 (group I), drawn to a method, classified in class 423, subclass 210+.
- II. Claims 42-60 (group II), drawn to an apparatus, classified in class 422, subclass 129+.

The inventions are distinct, each from the other, because the inventions set forth in claims 1-41 (group I) and claims 42-60 (group II) are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus, as claimed, can be used for another and materially different process such as the treatment of gases other than the claimed flue gas, such as air.

Because these inventions are distinct for the reasons given above and the claims set forth in groups I and II have acquired a separate status in the art as shown by their different classification; the claims set forth in groups I and II have acquired a separate status in the art because of their recognized divergent subject matter, and the search

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required for any selected group of claims is not required for the other non-selected group of claims, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. David Pritchard, Applicants' Attorney, on Nov. 14, 2002 a provisional election was made without traverse to prosecute the invention of the method, claims 1-41 (group I). Affirmation of this election must be made by the Applicants in their reply to this Office Action. Claims 42-60 (group II) are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

a) Figure 1 is objected to because it is not clear of it should be designated by a legend such as --Prior Art-- because the title banner "A Typical 500 MW Power Plant" and the disclosure set forth on pg. 29 Ins. 5 and 6 suggests that only that which is old is illustrated. See MPEP § 608.02(g).

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- b) Fig. 1 is objected to as failing to comply with 37 CFR 1.84(p)(4) because the reference characters "11, 12, 14, 15, 16" have been used to designate the same feature and reference characters "13, 22, 24, 28" have both been used to designate the same feature.
- c) Fig. 2 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "21, 39" have been used to designate the same feature.
- d) Fig. 5 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "13, 28" have been used to designate the same feature.
- e) Fig. 1 is objected to as failing to comply with 37 CFR 1.84(p)(5) because it includes the reference sign "58", which is not mentioned in the description of Fig. 1 set forth in the specification.
- f) Fig. 5 is objected to as failing to comply with 37 CFR 1.84(p)(5) because it includes the reference sign "23", which is not mentioned in the description of Fig. 5 set forth in the specification.
- g) In Fig. 1, the writing inside features 38 and 40 is illegible.

A proposed drawing correction or corrected drawings are required in reply to the Office Action **to avoid abandonment** of the application. The objection to the drawings will **not be held in abeyance**.

Specification

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- a) In the Preliminary Amendment mailed on Nov. 14, 2002 (paper no. 2), the status of the 09-113,891 parent application has been updated by inserting --, now abandoned,- between "09/113,891" and "entitled".
- b) On pg. 4 ln. 22, "19088" has been replaced with "1988" via an Examiner's pen and ink amendment.
- c) On pg. 5 ln. 9, "pHospHorous" has been replaced with "phosphorous" via an Examiner's pen and ink amendment.

Claim Objections

- a) Claim 10 is objected to for being a functional duplicate of claim 2 because there is nothing to distinguish the "flue gas" of claim 10 from the "dust-reduced flue gas" of claim 2. Inserting the limitations of claim 13 into claim 10 would resolve this issue.
- b) There is no antecedent basis in claims 1-3 or 14 for the "additional dust-reduced flue gas" of claim 18.
- c) There is no antecedent basis in claims 1-3 or 14 for the "additional flue gas" of claim 19.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 39-41 are rejected under 35 U.S.C. 102(a and b) as anticipated by the Applicants' admission of the prior art illustrated in Applicants' Fig. 1 and admitted on pg. 2 ln. 2 to pg. 3 ln. 3; pg. 14 lns. 20 and 21 and pg. 29 lns. 5 and 6 in the Applicants' specification.

(The claims have been rejected under both 35USC102(a) and 35USC102(b) because it is not clear if the admitted prior art in the Applicants' specification is older than one year from the filing the date of this application. Any information the Applicants can give on the date of the admitted prior art in their specification is appreciated: please see section 706.02(c), 4th full paragraph in the MPEP (8th ed.)).

From the description of the prior art process set forth on pg. 2 ln. 2 to pg. 3 ln. 3; pg. 14 lns. 20 and 21 and pg. 29 lns. 5 and 6 in the Applicants' specification and illustrated in Applicants' Fig. 1, the known process for the electrostatic purification of dust and pollutant-containing flue gas, comprises the steps:

injecting slaked lime into the flue gas at location 46;

passing the lime-containing flue gas through a dry ESP 20 equipped with a heat exchanger, evidently to cool the flue gas and collect what appears to be calcium sulfite; calcium nitrate and calcium chloride solids out of the flue gas (please also see feature 40 illustrated in Fig. 1);

injecting ammonia into the flue gas at location 44;

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passing the ammonia-containing flue gas through a wet ESP 32 where water is sprayed into the flue gas to remove residual pollutants out of the flue gas to produce a purified flue gas and a pollutant-loaded scrub water;

passing the purified, flue gas through a heat exchanger 50 where it is heated;

discharging the heated, purified flue gas through the discharge stack 34;

passing the pollutant-loaded water 36 along with slaked lime 54 into what appears to be a collection/reaction sump 38 along where (evidently) the pollutant-loaded water reacts with the slaked lime 54 under such conditions as to generate gaseous ammonia 44 (which is recycled back to the ammonia injection point 44) and (solid?) calcium sulfite and calcium sulfate compounds;

passing the water through a heat exchanger 56 where it is cooled;

passing the cooled water into a collection sump 40, where calcium nitrate and calcium chloride salts are removed from the cooled water, and

recycling the purified water 42 back to the wet ESP 32.

A portion of the heat was transferred from the hot flue gas entering the dry ESP to the heat exchanger 50 (where it heated the cleaned flue gas), and another portion of the heat was transferred to the untreated, pollutant-loaded water 36 through a closed, heat exchange circuit 48.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-38 are rejected under 35 U.S.C. 102(a and b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the Applicants' admission of the prior art illustrated in Applicants' Fig. 1 and admitted on pg. 2 ln. 2 to pg. 3 ln. 3; pg. 14 lns. 20 and 21 and pg. 29 lns. 5 and 6 in the Applicants' specification in view of the Applicants' definition of "sensible cooling" on pg. 14 ln. 20 to pg. 15 ln. 4 in the Applicants' specification.

(The claims have been rejected under both 35USC102(a) and 35USC102(b) because it is not clear if the admitted prior art in the Applicants' specification is older than one year from the filing the date of this application. Any information the Applicants can give on the date of the admitted prior art in their specification is appreciated: please see section 706.02(c), 4th full paragraph in the MPEP (8th ed.)).

From the description of the prior art process set forth on pg. 2 ln. 2 to pg. 3 ln. 3; pg. 14 lns. 20 and 21 and pg. 29 lns. 5 and 6 in the Applicants' specification and illustrated in Applicants' Fig. 1, the known process for the electrostatic purification of dust and pollutant-containing flue gas, comprises the steps:

injecting slaked lime into the flue gas at location 46;

passing the lime-containing flue gas through a dry ESP 20 equipped with a heat exchanger, evidently to cool the flue gas and collect what appears to be calcium sulfite; calcium nitrate and calcium chloride solids out of the flue gas (please also see feature 40 illustrated in Fig. 1);

injecting ammonia into the flue gas at location 44;

passing the ammonia-containing flue gas through a wet ESP 32 where water is sprayed into the flue gas to remove residual pollutants out of the flue gas to produce a purified flue gas and a pollutant-loaded scrub water;

passing the purified, flue gas through a heat exchanger 50 where it is heated;

discharging the heated, purified flue gas through the discharge stack 34;

passing the pollutant-loaded water 36 along with slaked lime 54 into what appears to be a collection/reaction sump 38 along where (evidently) the pollutant-

loaded water reacts with the slaked lime 54 under such conditions as to generate gaseous ammonia 44 (which is recycled back to the ammonia injection point 44) and (solid?) calcium sulfite and calcium sulfate compounds;

passing the water through a heat exchanger 56 where it is cooled;

passing the cooled water into a collection sump 40, where calcium nitrate and calcium chloride salts are removed from the cooled water, and

recycling the purified water 42 back to the wet ESP 32.

A portion of the heat was transferred from the hot flue gas entering the dry ESP to the heat exchanger 50 (where it heated the cleaned flue gas), and another portion of the heat was transferred to the untreated, pollutant-loaded water 36 through a closed, heat exchange circuit 48.

The difference between the Applicants' claims and the prior process illustrated in Fig. 1 and discussed in (at least) pg. 2 ln. 2 to pg. 3 ln. 3 in the Applicants' specification is that Applicants' claim 1 sets forth that the flue gas is sensibly cooled, whereas Fig. 1 sets forth the use of a "heat exchanger" to cool the gas.

Pg. 14 ln. 20 to pg. 15 ln. 4 in the Applicants' specification defines "sensible cooling" as cooling without changing the humidity of the flue gas.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to further describe* the effect of "heat exchanger" which part of feature 20 in the prior process illustrated in Applicants' Fig. 1 and discussed on (at least) pg. 2 ln. 2 to pg. 3 ln. 3 in the Applicants' specification on the flue gas as "sensibly cooling" the flue gas, in the manner set forth in at least the Applicants' claim 1,

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because the Applicants' definition of "sensible cooling" set forth on pg. 14 ln. 20 to pg. 15 ln. 4 in the Applicants' specification *renders obvious* the inherent property of heat exchangers to "sensibly cool" the flue gas, since water is neither being added to or taken from the flue gas in the heat exchanger. Since this difference inherently occurs in the prior art process, then these claims are rejected under 35USC102 - as well as 35USC103.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. 4,340,207 disclosing that sensible cooling of the stack gas prior to quenching greatly reduces water consumption;

U. S. Pat. 5,569,436 disclosing a process for the removal of mercury and cadmium from flue gases, and

U. S. Pat. 5,575,982 disclosing a process for treating exhaust gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-

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872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv
December 10, 2002


Timothy Vanoy
Patent Examiner
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